

5 What is claimed is:

1. A lead electrode assembly for subcutaneous implantation comprising:

an electrode;

at least two channel guides coupled to the electrode
10 for positioning the lead electrode assembly.

2. The lead electrode assembly of claim 1, wherein the electrode is substantially planar.

3. The lead electrode assembly of claim 2, wherein the at least two channel guides comprise a first channel guide and a second channel guide and wherein the first channel guide is coupled to a first side of the electrode and the second channel guide is coupled to a second side of the electrode.

20 4. The lead electrode assembly of claim 3, wherein the first channel guide and the second channel guide each comprise a strip of material.

25 5. The lead electrode assembly of claim 4, wherein the strip of material comprises a polymeric material..

5 6. The lead electrode assembly of claim 5, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures
10 thereof.

7. The lead electrode assembly of claim 4, wherein the strip of material is coupled to the electrode with stitching.

15 8. The lead electrode assembly of claim 4, wherein the strip of material has a rectangular shape.

20 9. The lead electrode assembly of claim 4, wherein an inner side of the strip of material is coupled to the electrode.

25 10. The lead electrode assembly of claim 9, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled between the inner side of the strip of material and the electrode.

11. The lead electrode assembly of claim 9, wherein the electrode is substantially planar comprising a first side, a second side, a top surface and a bottom surface.

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12. The lead electrode assembly of claim 11, wherein the inner side of the strip of material is coupled to the top surface and the bottom surface of the electrode.

10 13. The lead electrode assembly of claim 11, wherein the inner side of the strip of material comprising the first channel guide is coupled to the top surface and the bottom surface of the electrode on the first side of the electrode.

15 14. The lead electrode assembly of claim 13, wherein the lead electrode assembly further comprises a backing layer, wherein the backing layer is coupled between the top surface of the first side of the electrode and the inner side of the strip of material comprising the first channel guide.

20 15. The lead electrode assembly of claim 14, wherein the inner side of the strip of material comprising the second channel guide is coupled to the top surface and bottom surface of the electrode on the second side of the electrode.

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16. The lead electrode assembly of claim 15, wherein the backing layer is coupled between the top surface of the second

5 side of the electrode and the inner side of the strip of material comprising the second channel guide.

17. The lead electrode assembly of claim 4, wherein the lead electrode assembly further comprises a molded cover,
10 wherein the molded cover is coupled to the electrode.

18. The lead electrode assembly of claim 17, wherein the strip of material is attached to the molded cover.

19. The lead electrode assembly of claim 18, wherein the molded cover forms a skirt around the electrode.

20. The lead electrode assembly of claim 17, wherein the molded cover is composed of a polymeric material.

21. The lead electrode assembly of claim 20, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a 25 polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

5 22. The lead electrode assembly of claim 3, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled to the electrode.

10 23. The lead electrode assembly of claim 22, wherein the molded cover partially covers the electrode.

20 24. The lead electrode assembly of claim 23, wherein the molded cover forms a skirt around the electrode.

15 25. The lead electrode assembly of claim 22, wherein the molded cover is composed of a polymeric material.

20 26. The lead electrode assembly of claim 25, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

25 27. The lead electrode assembly of claim 22, wherein the first channel guide and the second channel guide are formed as part of the molded cover.

5 28. The lead electrode assembly of claim 1, wherein the electrode comprises a mesh of metallic material.

29. The lead electrode assembly of claim 28, wherein the metallic material is selected from the group consisting
10 essentially of titanium, nickel alloys, stainless steel alloys,
platinum, platinum iridium, and mixtures thereof.

15 30. The lead electrode assembly of claim 1, wherein the electrode comprises a substantially flat sheet of metallic
material.

20 31. The lead electrode assembly of claim 30, wherein the metallic material is selected from the group consisting
essentially of titanium, nickel alloys, stainless steel alloys,
platinum, platinum iridium, and mixtures thereof.

32. The lead electrode assembly of claim 1, wherein the electrode comprises at least one surface.

25 33. The lead electrode assembly of claim 32, wherein the electrode is substantially planar.

5 34. The lead electrode assembly of claim 32, wherein the said at least one surface has a surface area between approximately 100 square millimeters and approximately 2000 square millimeters.

10 35. The lead electrode assembly of claim 1, wherein the lead electrode assembly further comprises a lead, wherein the lead is coupled to the electrode.

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15 36. The lead electrode assembly of claim 35, wherein the lead comprises one or more electrical conductors and an electrically insulating sheath, wherein the electrically insulating sheath encloses said one or more electrical conductors.

20 37. The lead electrode assembly of claim 35, wherein the said one or more electrical conductors are electrically coupled to the electrode.

25 38. The lead electrode assembly of claim 35, wherein the lead electrode assembly further comprises a connector, wherein the lead comprises a proximal end and a distal end and wherein the connector is physically connected to the distal end of the lead.

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39. The lead electrode assembly of claim 38, wherein the connector is electrically coupled to the electrode.

40. The lead electrode assembly of claim 35, the lead is
10 between approximately 5 cm and approximately 52 cm in length.

41. The lead electrode assembly of claim 40, wherein the lead is between approximately 5 cm and approximately 30 cm in length.

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42. The lead electrode assembly of claim 41, wherein the lead is between approximately 10 cm and approximately 20 cm in length.

43. The lead electrode assembly of claim 40, wherein the lead length is one of a plurality of pre-set lengths.

44. The lead electrode assembly of claim 43, wherein the pre-set lengths vary by approximately 10 cm.

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45. The lead electrode assembly of claim 35, wherein the lead has a proximal end and a distal end and further wherein the

5 proximal end of the lead is physically connected to the electrode.

46. The lead electrode assembly of claim 45, wherein the lead electrode assembly further comprises a lead fastener
10 coupled between the lead and the electrode.

47. A lead electrode assembly for use with an implantable cardioverter-defibrillator subcutaneously implanted outside the ribcage between the third and twelfth ribs comprising:

15 an electrode;
a first channel guide and a second channel guide
coupled to the electrode for positioning the lead
electrode assembly.

20 48. The lead electrode assembly of claim 47, wherein the electrode is substantially planar.

49. The lead electrode assembly of claim 48, wherein the at least two channel guides comprise a first channel guide and a
25 second channel guide and wherein the first channel guide is coupled to a first side of the electrode and the second channel guide is coupled to a second side of the electrode.

5 50. The lead electrode assembly of claim 49, wherein the first channel guide and the second channel guide each comprise a strip of material.

10 51. The lead electrode assembly of claim 50, wherein the strip of material comprises a polymeric material.

15 52. The lead electrode assembly of claim 51, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

20 53. The lead electrode assembly of claim 50, wherein the strip of material is coupled to the electrode with stitching.

54. The lead electrode assembly of claim 50, wherein the strip of material has a rectangular shape.

25 55. The lead electrode assembly of claim 50, wherein an inner side of the strip of material is coupled to the electrode.

5 56. The lead electrode assembly of claim 55, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled between the inner side of the strip of material and the electrode.

10 57. The lead electrode assembly of claim 55, wherein the electrode is substantially planar comprising a first side, a second side, a top surface and a bottom surface.

15 58. The lead electrode assembly of claim 57, wherein the inner side of the strip of material is coupled to the top surface and the bottom surface of the electrode.

20 59. The lead electrode assembly of claim 57, wherein the inner side of the strip of material comprising the first channel guide is coupled to the top surface and the bottom surface of the electrode on the first side of the electrode.

25 60. The lead electrode assembly of claim 59, wherein the lead electrode assembly further comprises a backing layer, wherein the backing layer is coupled between the top surface of the first side of the electrode and the inner side of the strip of material comprising the first channel guide.

5 61. The lead electrode assembly of claim 60, wherein the inner side of the strip of material comprising the second channel guide is coupled to the top surface and bottom surface of the electrode on the second side of the electrode.

10 62. The lead electrode assembly of claim 61, wherein the backing layer is coupled between the top surface of the second side of the electrode and the inner side of the strip of material comprising the second channel guide.

15 63. The lead electrode assembly of claim 50, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled to the electrode.

20 64. The lead electrode assembly of claim 63, wherein the strip of material is attached to the molded cover.

65. The lead electrode assembly of claim 64, wherein the molded cover forms a skirt around the electrode.

25 66. The lead electrode assembly of claim 63, wherein the molded cover is composed of a polymeric material.

5 67. The lead electrode assembly of claim 66, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures
10 thereof.

68. The lead electrode assembly of claim 49, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled to the electrode.

15 69. The lead electrode assembly of claim 68, wherein the molded cover partially covers the electrode.

20 70. The lead electrode assembly of claim 69, wherein the molded cover forms a skirt around the electrode.

71. The lead electrode assembly of claim 68, wherein the molded cover is composed of a polymeric material.

25 72. The lead electrode assembly of claim 71, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a

5 polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

73. The lead electrode assembly of claim 68, wherein the first channel guide and the second channel guide are formed as
10 part of the molded cover.

74. The lead electrode assembly of claim 47, wherein the electrode comprises a mesh of metallic material.

15 75. The lead electrode assembly of claim 74, wherein the metallic material is selected from the group consisting essentially of titanium, nickel alloys, stainless steel alloys, platinum, platinum iridium, and mixtures thereof.

20 76. The lead electrode assembly of claim 47, wherein the electrode comprises a substantially flat sheet of metallic material.

77. The lead electrode assembly of claim 76, wherein the
25 metallic material is selected from the group consisting essentially of titanium, nickel alloys, stainless steel alloys, platinum, platinum iridium, and mixtures thereof.

5 78. The lead electrode assembly of claim 47, wherein the electrode comprises at least one surface.

79. The lead electrode assembly of claim 78, wherein the electrode is substantially planar.

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80. The lead electrode assembly of claim 78, wherein the said at least one surface has a surface area between approximately 100 square millimeters and approximately 2000 square millimeters.

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81. The lead electrode assembly of claim 47, wherein the lead electrode assembly further comprises a lead, wherein the lead is coupled to the electrode.

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82. The lead electrode assembly of claim 81, wherein the lead comprises one or more electrical conductors and an electrically insulating sheath, wherein the electrically insulating sheath encloses said one or more electrical conductors.

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83. The lead electrode assembly of claim 81, wherein the said one or more electrical conductors are electrically coupled to the electrode.

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84. The lead electrode assembly of claim 81, wherein the lead electrode assembly further comprises a connector, wherein the lead comprises a proximal end and a distal end and wherein the connector is physically connected to the distal end of the 10 lead.

85. The lead electrode assembly of claim 84, wherein the connector is electrically coupled to the electrode.

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86. The lead electrode assembly of claim 81, the lead is between approximately 5 cm and approximately 52 cm in length.

87. The lead electrode assembly of claim 86, wherein the lead is between approximately 5 cm and approximately 30 cm in 20 length.

88. The lead electrode assembly of claim 87, wherein the lead is between approximately 10 cm and approximately 20 cm in 25 length.

89. The lead electrode assembly of claim 86, wherein the lead length is one of a plurality of pre-set lengths.

5 90. The lead electrode assembly of claim 89, wherein the pre-set lengths vary by approximately 10 cm.

10 91. The lead electrode assembly of claim 81, wherein the lead has a proximal end and a distal end and further wherein the proximal end of the lead is physically connected to the electrode.

15 92. The lead electrode assembly of claim 91, wherein the lead electrode assembly further comprises a lead fastener coupled between the lead and the electrode.

20 93. A lead electrode assembly for subcutaneous implantation in a patient's posterior thorax from an incision in the skin covering the patient's anterior thorax comprising:
an electrode;
a first channel guide and a second channel guide coupled to the electrode for positioning the lead electrode assembly.

25 94. The lead electrode assembly of claim 93, wherein the electrode is substantially planar.

5 95. The lead electrode assembly of claim 94, wherein the at least two channel guides comprise a first channel guide and a second channel guide and wherein the first channel guide is coupled to a first side of the electrode and the second channel guide is coupled to a second side of the electrode.

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96. The lead electrode assembly of claim 95, wherein the first channel guide and the second channel guide each comprise a strip of material.

15 97. The lead electrode assembly of claim 96, wherein the strip of material comprises a polymeric material.

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98. The lead electrode assembly of claim 97, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

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99. The lead electrode assembly of claim 96, wherein the strip of material is coupled to the electrode with stitching.

5 100. The lead electrode assembly of claim 96, wherein the strip of material has a rectangular shape.

101. The lead electrode assembly of claim 96, wherein an inner side of the strip of material is coupled to the electrode.

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102. The lead electrode assembly of claim 101, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled between the inner side of the strip of material and the electrode.

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103. The lead electrode assembly of claim 101, wherein the electrode is substantially planar comprising a first side, a second side, a top surface and a bottom surface.

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104. The lead electrode assembly of claim 103, wherein the inner side of the strip of material is coupled to the top surface and the bottom surface of the electrode.

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105. The lead electrode assembly of claim 103, wherein the inner side of the strip of material comprising the first channel guide is coupled to the top surface and the bottom surface of the electrode on the first side of the electrode.

5 106. The lead electrode assembly of claim 105, wherein the lead electrode assembly further comprises a backing layer, wherein the backing layer is coupled between the top surface of the first side of the electrode and the inner side of the strip of material comprising the first channel guide.

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107. The lead electrode assembly of claim 106, wherein the inner side of the strip of material comprising the second channel guide is coupled to the top surface and bottom surface of the electrode on the second side of the electrode.

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108. The lead electrode assembly of claim 107, wherein the backing layer is coupled between the top surface of the second side of the electrode and the inner side of the strip of material comprising the second channel guide.

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109. The lead electrode assembly of claim 96, wherein the lead electrode assembly further comprises a molded cover, wherein the molded cover is coupled to the electrode.

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110. The lead electrode assembly of claim 109, wherein the strip of material is attached to the molded cover.

5 111. The lead electrode assembly of claim 110, wherein the
molded cover forms a skirt around the electrode.

112. The lead electrode assembly of claim 109, wherein the
molded cover is composed of a polymeric material.

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113. The lead electrode assembly of claim 112, wherein the
polymeric material is selected from the group consisting
essentially of a polyurethane, a polyamide, a
polyetheretherketone (PEEK), a polyether block amide (PEBA), a
polytetrafluoroethylene (PTFE), a silicone, and mixtures
thereof.

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114. The lead electrode assembly of claim 95, wherein the
lead electrode assembly further comprises a molded cover,
wherein the molded cover is coupled to the electrode.

115. The lead electrode assembly of claim 114, wherein the
molded cover partially covers the electrode.

25 116. The lead electrode assembly of claim 115, wherein the
molded cover forms a skirt around the electrode.

5 117. The lead electrode assembly of claim 114, wherein the
molded cover is composed of a polymeric material.

118. The lead electrode assembly of claim 117, wherein the
polymeric material is selected from the group consisting
10 essentially of a polyurethane, a polyamide, a
polyetheretherketone (PEEK), a polyether block amide (PEBA), a
polytetrafluoroethylene (PTFE), a silicone, and mixtures
thereof.

15 119. The lead electrode assembly of claim 114, wherein the
first channel guide and the second channel guide are formed as
part of the molded cover.

20 120. The lead electrode assembly of claim 93, wherein the
electrode comprises a mesh of metallic material.

25 121. The lead electrode assembly of claim 120, wherein the
metallic material is selected from the group consisting
essentially of titanium, nickel alloys, stainless steel alloys,
platinum, platinum iridium, and mixtures thereof.

5 122. The lead electrode assembly of claim 93, wherein the electrode comprises a substantially flat sheet of metallic material.

10 123. The lead electrode assembly of claim 122, wherein the metallic material is selected from the group consisting essentially of titanium, nickel alloys, stainless steel alloys, platinum, platinum iridium, and mixtures thereof.

15 124. The lead electrode assembly of claim 93, wherein the electrode comprises at least one surface.

20 125. The lead electrode assembly of claim 124, wherein the electrode is substantially planar.

25 126. The lead electrode assembly of claim 124, wherein the said at least one surface has a surface area between approximately 100 square millimeters and approximately 2000 square millimeters.

30 127. The lead electrode assembly of claim 93, wherein the lead electrode assembly further comprises a lead, wherein the lead is coupled to the electrode.

5 128. The lead electrode assembly of claim 127, wherein the lead comprises one or more electrical conductors and an electrically insulating sheath, wherein the electrically insulating sheath encloses said one or more electrical conductors.

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129. The lead electrode assembly of claim 127, wherein the said one or more electrical conductors are electrically coupled to the electrode.

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130. The lead electrode assembly of claim 127, wherein the lead electrode assembly further comprises a connector, wherein the lead comprises a proximal end and a distal end and wherein the connector is physically connected to the distal end of the lead.

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131. The lead electrode assembly of claim 130, wherein the connector is electrically coupled to the electrode.

25 132. The lead electrode assembly of claim 127, the lead is between approximately 5 cm and approximately 52 cm in length.

5 133. The lead electrode assembly of claim 132, wherein the lead is between approximately 5 cm and approximately 30 cm in length.

10 134. The lead electrode assembly of claim 133, wherein the lead is between approximately 10 cm and approximately 20 cm in length.

15 135. The lead electrode assembly of claim 132, wherein the lead length is one of a plurality of pre-set lengths.

20 136. The lead electrode assembly of claim 135, wherein the pre-set lengths vary by approximately 10 cm.

25 137. The lead electrode assembly of claim 127, wherein the lead has a proximal end and a distal end and further wherein the proximal end of the lead is physically connected to the electrode.

30 138. The lead electrode assembly of claim 137, wherein the lead electrode assembly further comprises a lead fastener coupled between the lead and the electrode.

5 139. An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

a housing; and
10 a lead electrode assembly coupled to the housing, wherein the lead electrode assembly comprises:
an electrode;
a first channel guide and a second channel guide coupled to the electrode for positioning the lead electrode assembly.

15 140. The implantable cardioverter-defibrillator of claim 139, wherein the electrode is substantially planar.

20 141. The implantable cardioverter-defibrillator of claim 140, wherein the at least two channel guides comprise a first channel guide and a second channel guide and wherein the first channel guide is coupled to a first side of the electrode and the second channel guide is coupled to a second side of the
25 electrode.

5 142. The implantable cardioverter-defibrillator of claim
141, wherein the first channel guide and the second channel
guide each comprise a strip of material.

10 143. The implantable cardioverter-defibrillator of claim
142, wherein the strip of material comprises a polymeric
material.

15 144. The implantable cardioverter-defibrillator of claim
143, wherein the polymeric material is selected from the group
consisting essentially of a polyurethane, a polyamide, a
polyetheretherketone (PEEK), a polyether block amide (PEBA), a
polytetrafluoroethylene (PTFE), a silicone, and mixtures
thereof.

20 145. The implantable cardioverter-defibrillator of claim
142, wherein the strip of material is coupled to the electrode
with stitching.

25 146. The implantable cardioverter-defibrillator of claim
142, wherein the strip of material has a rectangular shape.

5 147. The implantable cardioverter-defibrillator of claim
142, wherein an inner side of the strip of material is coupled
to the electrode.

10 148. The implantable cardioverter-defibrillator of claim
147, wherein the lead electrode assembly further comprises a
molded cover, wherein the molded cover is coupled between the
inner side of the strip of material and the electrode.

15 149. The implantable cardioverter-defibrillator of claim
147, wherein the electrode is substantially planar comprising a
first side, a second side, a top surface and a bottom surface.

20 150. The implantable cardioverter-defibrillator of claim
149, wherein the inner side of the strip of material is coupled
to the top surface and the bottom surface of the electrode.

25 151. The implantable cardioverter-defibrillator of claim
149, wherein the inner side of the strip of material comprising
the first channel guide is coupled to the top surface and the
bottom surface of the electrode on the first side of the
electrode.

5 152: The implantable cardioverter-defibrillator of claim
151, wherein the lead electrode assembly further comprises a
backing layer, wherein the backing layer is coupled between the
top surface of the first side of the electrode and the inner
side of the strip of material comprising the first channel
10 guide.

153. The implantable cardioverter-defibrillator of claim
152, wherein the inner side of the strip of material comprising
the second channel guide is coupled to the top surface and
bottom surface of the electrode on the second side of the
electrode.

154. The implantable cardioverter-defibrillator of claim
153, wherein the backing layer is coupled between the top
surface of the second side of the electrode and the inner side
20 of the strip of material comprising the second channel guide.

155. The implantable cardioverter-defibrillator of claim
142, wherein the lead electrode assembly further comprises a
25 molded cover, wherein the molded cover is coupled to the
electrode.

5 156. The implantable cardioverter-defibrillator of claim
155, wherein the strip of material is attached to the molded
cover.

10 157. The implantable cardioverter-defibrillator of claim
156, wherein the molded cover forms a skirt around the
electrode.

15 158. The implantable cardioverter-defibrillator of claim
155, wherein the molded cover is composed of a polymeric
material.

20 159. The implantable cardioverter-defibrillator of claim
158, wherein the polymeric material is selected from the group
consisting essentially of a polyurethane, a polyamide, a
polyetheretherketone (PEEK), a polyether block amide (PEBA), a
polytetrafluoroethylene (PTFE), a silicone, and mixtures
thereof.

25 160. The implantable cardioverter-defibrillator of claim
141, wherein the lead electrode assembly further comprises a
molded cover, wherein the molded cover is coupled to the
electrode.

5 161. The implantable cardioverter-defibrillator of claim
160, wherein the molded cover partially covers the electrode.

162. The implantable cardioverter-defibrillator of claim
161, wherein the molded cover forms a skirt around the
10 electrode.

163. The implantable cardioverter-defibrillator of claim
160, wherein the molded cover is composed of a polymeric
material.

164. The implantable cardioverter-defibrillator of claim
163, wherein the polymeric material is selected from the group
consisting essentially of a polyurethane, a polyamide, a
polyetheretherketone (PEEK), a polyether block amide (PEBA), a
polytetrafluoroethylene (PTFE), a silicone, and mixtures
20 thereof.
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165. The implantable cardioverter-defibrillator of claim
160, wherein the first channel guide and the second channel
25 guide are formed as part of the molded cover.

5 166. The implantable cardioverter-defibrillator of claim
139, wherein the electrode comprises a mesh of metallic
material.

10 167. The implantable cardioverter-defibrillator of claim
166, wherein the metallic material is selected from the group
consisting essentially of titanium, nickel alloys, stainless
steel alloys, platinum, platinum iridium, and mixtures thereof.

15 168. The implantable cardioverter-defibrillator of claim
139, wherein the electrode comprises a substantially flat sheet
of metallic material.

20 169. The implantable cardioverter-defibrillator of claim
168, wherein the metallic material is selected from the group
consisting essentially of titanium, nickel alloys, stainless
steel alloys, platinum, platinum iridium, and mixtures thereof.

25 170. The implantable cardioverter-defibrillator of claim
139, wherein the electrode comprises at least one surface.

171. The implantable cardioverter-defibrillator of claim
170, wherein the electrode is substantially planar.

5 172. The implantable cardioverter-defibrillator of claim 170, wherein the said at least one surface has a surface area between approximately 100 square millimeters and approximately 2000 square millimeters.

10 173. The implantable cardioverter-defibrillator of claim 139, wherein the lead electrode assembly further comprises a lead, wherein the lead is coupled between the electrode and the housing.

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174. The implantable cardioverter-defibrillator of claim 173, wherein the lead comprises one or more electrical conductors and an electrically insulating sheath, wherein the electrically insulating sheath encloses said one or more electrical conductors.

20 175. The implantable cardioverter-defibrillator of claim 173, wherein the said one or more electrical conductors are electrically coupled to the electrode.

25 176. The implantable cardioverter-defibrillator of claim 173, wherein the lead electrode assembly further comprises a connector, wherein the lead comprises a proximal end and a

5 distal end and wherein the connector is physically connected to
the distal end of the lead.

177. The implantable cardioverter-defibrillator of claim
176, wherein the connector is electrically coupled to the
10 electrode.

178. The implantable cardioverter-defibrillator of claim
173, the lead is between approximately 5 cm and approximately 52
cm in length.

179. The implantable cardioverter-defibrillator of claim
178, wherein the lead is between approximately 5 cm and
approximately 30 cm in length.

180. The implantable cardioverter-defibrillator of claim
179, wherein the lead is between approximately 10 cm and
approximately 20 cm in length.

181. The implantable cardioverter-defibrillator of claim
25 180, wherein the lead length is one of a plurality of pre-set
lengths.

5 182. The implantable cardioverter-defibrillator of claim
181, wherein the pre-set lengths vary by approximately 10 cm.

183. The implantable cardioverter-defibrillator of claim
173, wherein the lead has a proximal end and a distal end and
10 further wherein the proximal end of the lead is physically
connected to the electrode.

184. The implantable cardioverter-defibrillator of claim
183, wherein the lead electrode assembly further comprises a
lead fastener coupled between the lead and the electrode.

185. A lead electrode assembly manipulation tool
comprising:

20 a rod; and
 a pair of tines for capturing a lead electrode
 assembly having a first channel guide and a second
 channel guide, wherein the pair of tines is coupled to
 the rod.

25 186. The lead electrode assembly manipulation tool of claim
185, wherein each of the pair of tines is substantially parallel
to the other.

5 187. The lead electrode assembly manipulation tool of claim
185, wherein each of the pair of tines is separated from the
other by a gap.

10 188. The lead electrode assembly manipulation tool of claim
185, wherein the pair of tines is substantially straight.

15 189. The lead electrode assembly manipulation tool of claim
185, wherein the lead electrode assembly manipulation tool
further comprises a tine base, wherein the tine base is
connected to the rod and further wherein the tine base is
connected to the pair of tines.

20 190. The lead electrode assembly manipulation tool of claim
189, wherein each of the pair of tines comprises a proximal end
and a distal end and further wherein the proximal ends of the
pair of tines are attached to the tine base.

25 191. The lead electrode assembly manipulation tool of claim
190, wherein the distal end of each of the pair of tines is
rounded.

5 192. The lead electrode assembly manipulation tool of claim
189, wherein the rod has a proximal end and a distal end and
wherein the distal end of the rod is connected to the tine base.

10 193. The lead electrode assembly manipulation tool of claim
192, wherein the lead electrode assembly manipulation tool
further comprises a handle, wherein the handle is coupled to the
proximal end of the rod.

15 194. The lead electrode assembly manipulation tool of claim
185, wherein the rod is curved.

20 195. The lead electrode assembly manipulation tool of claim
185, wherein the pair of tines is composed a metallic material.

25 196. The lead electrode assembly of claim 195, wherein the
metallic material is selected from the group consisting
essentially of titanium, nickel alloys, stainless steel alloys,
platinum, platinum iridium, and mixtures thereof.

30 197. The lead electrode assembly manipulation tool of claim
185, wherein the pair of tines is composed of a polymeric
material.

5 198. The lead electrode assembly of claim 197, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures
10 thereof.

199. The lead electrode assembly manipulation tool of claim 185, wherein the rod is composed a metallic material.

200. The lead electrode assembly of claim 199, wherein the metallic material is selected from the group consisting essentially of titanium, nickel alloys, stainless steel alloys, platinum, platinum iridium, and mixtures thereof.

201. The lead electrode assembly manipulation tool of claim 185, wherein the rod is composed of a polymeric material.

202. The lead electrode assembly of claim 201, wherein the polymeric material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

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203. A method for surgically implanting a lead electrode assembly subcutaneously outside a patient's ribcage, the method comprising the steps of:

providing a lead electrode assembly having a first channel guide and a second channel guide;

10 providing a lead electrode assembly manipulation tool;

creating a subcutaneous path outside the ribcage;

capturing the lead electrode assembly with the lead electrode assembly manipulation tool;

15 moving the lead electrode assembly through the path;

and

releasing the lead electrode assembly from the lead electrode assembly manipulation tool.

204. The method of claim 203, wherein the step of creating a subcutaneous path outside the ribcage further comprises the steps of:

providing a hemostat;

25 creating an incision in the thoracic region of the patient; and

creating the subcutaneous path by moving the hemostat between the ribcage and the skin.

5 205. The method of claim 204, wherein the step of creating
the subcutaneous path by moving the hemostat between the ribcage
and the skin further comprises the step of:

10 moving the hemostat laterally and posteriorly around
the side of the patient until the subcutaneous path
terminates at a termination point such that if a
straight line were drawn from the incision to the
termination point, the line would intersect the heart
of the patient.

15 206. The method of claim 204, wherein the step of creating
the subcutaneous path by moving the hemostat between the ribcage
and the skin further comprises the step of:

20 moving the hemostat laterally and posteriorly around
the side of the patient until the subcutaneous path
terminates at a termination point within 10 cm of the
spine of the patient between the third and twelfth
rib.

25 207. The method of claim 204, wherein the incision in the
thoracic region of the patient is in the anterior of the thorax.

208. The method of claim 204, wherein the lead electrode
assembly manipulation tool comprises a rod and a pair of tines.

5

209. The method of claim 208, wherein the step of capturing the lead electrode assembly with the lead electrode assembly manipulation tool further comprises the step of:

10 sliding one of the pair of tines of the lead electrode assembly manipulation tool into each of the first channel guide and second channel guide of the lead electrode assembly.

15 210. The method of claim 208, wherein the step of capturing the lead electrode assembly with the lead electrode assembly manipulation tool further comprises the step of:

20 holding the lead of the lead electrode assembly still relative to the rod of the lead electrode assembly manipulation tool.

25 211. The method of claim 208, wherein the step of capturing the lead electrode assembly with the lead electrode assembly manipulation tool further comprises the step of:

holding the lead of the lead electrode assembly against the rod of the lead electrode assembly manipulation tool.

5 212. The method of claim 208, wherein the step of releasing
the lead electrode assembly from the lead electrode assembly
manipulation tool further comprises the step of:

10 allowing the lead of the lead electrode assembly to
move relative to the rod of the lead electrode
assembly manipulation tool.

15 213. A subcutaneous implantable cardioverter-defibrillator
kit for use in surgically implanting a subcutaneous implantable
cardioverter-defibrillator and a lead electrode assembly within
a patient comprising:

20 a tray; and
 a lead electrode assembly having a first channel guide
and a second channel guide stored in the tray.

25 214. The subcutaneous implantable cardioverter-
defibrillator kit of claim 213, further comprising a lead
electrode assembly manipulation tool having a pair of tines,
wherein the lead electrode assembly manipulation tool is stored
in the tray.

25

215. The subcutaneous implantable cardioverter-
defibrillator kit of claim 213, further comprising a
subcutaneous implantable cardioverter-defibrillator, wherein the

5 subcutaneous implantable cardioverter-defibrillator is stored in the tray.

216. The subcutaneous implantable cardioverter-defibrillator kit of claim 213, further comprising a medical adhesive, wherein the medical adhesive is stored in the tray.

217. The subcutaneous implantable cardioverter-defibrillator kit of claim 213, further comprising anesthetic, wherein the anesthetic is stored in the tray.

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218. The subcutaneous implantable cardioverter-defibrillator kit of claim 213, further comprising a tube of mineral oil, wherein the tube of mineral oil is stored in the tray.